

SUMMARY OF FINDINGS RELATED TO SERVICE-QUALITY BENCHMARKING EFFORTS

Prepared for:

The Massachusetts Electric and Gas Distribution Companies

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I. BACKGROUND

In an order issued by the Massachusetts Department of Telecommunications and Energy (“DTE” or the “Department”) on June 29, 2001 in Service Quality Investigation, DTE 99-84, the DTE directed each gas and electric distribution company to provide a written report to the Department within 18 months of that Order, which (1) details its individual service-quality data collection efforts; (2) identifies what nationwide, regionwide, and statewide performance data is potentially available for a comprehensive database; and (3) assesses the feasibility of establishing a cooperative approach to comparative benchmarking under which all gas and electric companies would jointly develop a data-gathering/data-sharing consortium that would compile comparative data.

Navigant Consulting, Inc. (“Navigant” or “NCI”) was retained by the Massachusetts electric and gas distribution companies¹ to identify the availability and nature of statewide, regional, or nationwide data that would correlate with the service-quality measures established by the Department in DTE 99-84. Navigant also researched the outcome of any state public-utility commission proceedings where the issue of comparative service-quality benchmarking had been considered.

This report summarizes NCI’s findings related to the availability and applicability of the service-quality standards adopted by other state commissions. Navigant also provides an assessment of the usefulness of the sources of data potentially available from federal agencies, private companies or consortiums, and industry associations for purposes of benchmarking service-quality measures. NCI assesses the comparability of available data to each of the primary service-quality measures promulgated in Massachusetts. Our report also includes a discussion on the feasibility and usefulness of establishing a benchmarking consortium among the Distribution Companies.

¹ The Distribution Companies include: Bay State Gas Company, The Berkshire Gas Company, Fitchburg Gas and Electric Light Company, KeySpan Energy Delivery New England, Massachusetts Electric Company, Nantucket Electric Company, New England Gas Company, NSTAR Electric, NSTAR Gas Company, and Western Massachusetts Electric Company.

APPROACH

Navigant employed a three-step approach to this assignment. First, we reviewed information from other U.S. state regulatory jurisdictions, federal agencies and private/industry associations to determine whether they had adopted service-quality standards similar to those adopted by the Department. To the extent possible, NCI collected the most recent service-quality rules and standards by jurisdiction; determined whether the standards were company-specific, statewide, regionwide or nationwide; identified what reporting requirements related to the standards exist, and assessed how the jurisdiction monitors the performance of the regulated companies against such standards. NCI directly contacted over 30 electric and gas state regulatory commissions to confirm or update information obtained from public sources. We were also able to obtain information regarding existing service-quality measures for many of the remaining states via the respective regulatory commission's websites. NCI also contacted representatives from the Edison Electric Institute ("EEI"), the American Gas Association ("AGA"), the National Association of Regulatory Utility Commissioners ("NARUC"), and the Institute of Electrical and Electronics Engineers ("IEEE").

Second, NCI researched, and where applicable, acquired available data sources pertaining to service-quality standards similar to those adopted by the Department. Our report identifies the existence of such data sources, whether the information is available publicly, and whether the information is suitable for the benchmarking efforts envisioned by the Department.

Finally, NCI translated this research into useful summaries with attendant commentary for the Distribution Companies and for the Department. In addition to reporting on the results of its research, NCI also offers insights related to whether and how available data could be used to (1) monitor the performance of the Distribution Companies, (2) compare the performance of these companies, and (3) establish useful and appropriate service-quality targets.

MASSACHUSETTS SERVICE-QUALITY STANDARDS

Navigant's analyses focused on the nine service-quality measures identified by the DTE. Specific reporting requirements and standards established for Massachusetts utilities in DTE 99-84 are set forth in Table 1. Note that the Order in DTE 99-84 provided specific targets for some categories whereas other categories are based on historical performance or survey data. For each of these measures, Navigant critiqued the source and availability of comparable data, and provides conclusions regarding the applicability.

Table 1 – Summary of Massachusetts Service-quality Standards

Category	Benchmark
Reliability & Safety SAIFI & SAIDI Class I & II Odor Calls Lost Work-Day Incident Rate	5 Year Average w/ Statistical Variations 95% Percent Responded to in One Hour or Less Number of Injuries per 200,000 hours
Customer Service & Billing Calls Handled Service Appointments On-Cycle Meter Reads	Percent Handled w/in 20 Seconds* Service Appointments Met As Scheduled Percent Read within Monthly Read Cycle
Customer Satisfaction Consumer Division Cases Residential Billing Adjustments per 1000 Cust's	Based on Annual Measurements (Frequency) Based on Annual Measurements (Dollars)

* After 5 years of data have been collected, otherwise benchmark is based on available historical data

SOURCES OF DATA AND SERVICE-QUALITY STANDARDS

The primary source of data identified by NCI is at the state level, specified according to jurisdictional requirements imposed by each regulatory agency. This type of data is the most accessible and potentially the most comparable, and therefore it constituted a major component of our analysis.

Information is also available from federal agencies such as the Department of Energy ("DOE") and the Federal Energy Regulatory Commission ("FERC"). The available data often includes detailed financial and operational data elements that do not correspond to the service-quality factors measured by the DTE. With the exception of certain data collected by the U.S. Department of Labor, Bureau of Labor Statistics, or the Occupational Safety and Health Administration ("OSHA"), these federal departments or agencies do not collect information that would be useful to the DTE related to its service-quality measures.

Industry associations such as the EEI, IEEE, AGA, and the National Regulatory Research Institute (“NRRI”) gather data from time to time from subsets of their member companies and associations. Collected data periodically includes service-quality issues and survey data.

II. EXISTING SERVICE-QUALITY STANDARDS & AVAILABLE DATA

INTRODUCTION

The enabling legislation in state jurisdictions typically requires regulatory agencies to define and promulgate service-quality rules for those distribution utilities under its jurisdictions. In each jurisdiction, specific rules govern many aspects of service-quality for distribution utilities. Most contain provisions regarding voltage and frequency of service, customer billing and contact issues, and service interconnection standards. State rules and regulations often require utilities to maintain records and track certain types of activities including complaints and billing inquiries. This type of data is publicly available in some jurisdictions and the state commissions regularly report historical trends and statistics.

In addition to service-quality regulations applicable to all regulated distribution companies in the jurisdiction, state regulatory agencies also capture service-quality performance results via two other activities:

- Company-specific requirements resulting from tailored performance based regulation (“PBR”) plans, merger/acquisition approvals, or rate case decisions; and
- Reporting requirements and standards generated from industry investigations, mandated programs, or deregulation activities, similar to those outlined by the DTE in 99-84.

STATE ENACTED RULES AND STANDARDS

States increasingly have adopted service-quality reporting standards for reliability, and various categories of customer service, complaints and safety. In the mid 1990’s, only two states had adopted specific service-quality measures. Today, over one-half of the states in the U.S. now require electric utilities to report some form of service-quality data. The number of gas utilities that must report service-quality data similar to those defined in Massachusetts is significantly lower. As described herein, however, the type and basis for setting targets and/or reporting this information varies widely among the states.

Of the states that have adopted service-quality rules or standards, all require some form of reporting; a smaller group have established specific targets; an even smaller subset impose financial penalties or incentives based upon performance against these standards.² The type of reporting, standards and financial penalties and/or incentives within this group vary dramatically.

STATES THAT EMPLOY STANDARDS SIMILAR TO MASSACHUSETTS MANDATES

Navigant's research indicates there are approximately 30 states that have adopted some portions of the service-quality or reporting standards that are similar to those adopted in Massachusetts. Table 2 summarizes NCI's investigation for each service-quality standard. Note that Table 2 lists the number of states with reasonably similar service-quality standards or reporting to those adopted in Massachusetts.

Table 2 –States With Similar Service-quality Standards or Reporting

Category	Number of States
Reliability & Safety	
SAIFI or SAIDI	30
Class I & II Odor Calls	6
Lost Work-Day Incident Rate	See Comments
Customer Service & Billing	
Calls Handled	16
Service Appointments	6
On-Cycle Meter Reads	4
Customer Satisfaction	
Consumer Division Cases	21
Residential Billing Adjustments per 1000 Cust's	3

Appendix 1 provides similar information on a state-by-state basis.³

² Approximately 15 states impose some form of penalties or incentives for electric utilities, often in conjunction with performance based regulation or merger activities. Some states such as Vermont currently impose penalties for customer service targets only, with plans to later include reliability as well. Less than 10 of the states NCI contacted impose specific penalties or incentives for odor call response or customer service response targets. Commission staff that NCI contacted noted that Part 192 of the federal code for natural gas contains specific provisions for violation of leak responses and therefore, suggested that a penalty mechanism is already in place.

³ Information contained in the appendix includes data NCI was able to acquire as of the date of this report. It may exclude a limited number of recent or proposed regulations or activities that currently are underway.

ELECTRIC RELIABILITY

The states that have adopted electric reliability standards do not always use SAIFI and SAIDI statistics as a standard. Some states use other measures such as CAIDI or a combination of various indices or event-based measurements as a standard. Of the states adopting standards, approximately 30 states collect SAIFI and SAIDI data or employ these indices as a standard.

ELECTRIC & GAS SAFETY

In addition to SAIDI and SAIFI measures, Navigant also searched for data on Response to Odor Calls (from the gas industry) and Lost Work Time Incident rates. Gas company odor-response activities fall under rules promulgated under Part 192 of the Code of Federal Regulations. For example, Section 192.703 requires companies to respond to odor calls (i.e., potentially hazardous leaks). These requirements have generally been adopted as the minimum service standards for gas utilities.⁴ Navigant was only able to find five jurisdictions (Kansas, North Carolina, Washington, Illinois and Utah) that specified minimum response times for a gas leak. Although limited to a few states or utilities, response times generally were consistent with the one-hour target established by Massachusetts. Vermont, Georgia, Maryland and Rhode Island are currently in the midst of utility-specific or generic proceedings investigating similar service-quality standards.

Regarding Lost Work Time Incidents, most firms in the United States, including electric and gas utilities, keep a log of accidents (Form 300) and track employee illnesses and incidents (Form 301) in compliance with the OSHA regulations (1904). OSHA has the right to access this proprietary information, but restricts access to this information because confidential employee information is contained on the forms. The Bureau of Labor Statistics (“BLS”) performs annual statistical surveys, and uses these same reports from randomly selected companies across the country, with the employee information removed, to fill out its separate survey instrument. Thus a “cleaned” version of the data is used by the BLS to produce industry specific (by SIC code) charts and tables.

⁴ Some states have minor revisions to Part 192 incorporated into their regulations.

CUSTOMER SERVICE & BILLING

Approximately 20 states have established customer service related measures and reporting requirements for electric and gas utilities. The most common of such measures relate to complaint tracking and telephone response times. The number of states that require gas utilities to meet established customer service targets similar to those outlined for electric utilities appears to be substantially lower.⁵

COMPANY-SPECIFIC STANDARDS

In addition to statewide reporting and service standards, approximately 17 states have company-specific requirements that result from rate case or merger stipulations. These states have implemented or are currently considering some form of PBR through individual company settlements and stipulations. Not all of these plans, however, have explicit service-quality measures. Some states specify gas-only or electric-only standards, while others include combination utilities. Each program, typically exhibits some form of incentive-based pricing, profit, or performance mechanism.

Over the past five years, over 100 mergers have been announced in the electric and gas utility industry. As of December 2002, 85 percent of these have been completed. In order to obtain approval of the mergers, companies frequently agree to specific levels of service-quality performance, customer guarantees, and rate freezes. A number of the results and targets are confidential; thus, not all of this information is kept current for the public, nor is it tracked consistently. Some of these mergers have occurred across jurisdictional borders, between gas and electric firms, and among affiliates of larger firms, so specific service-quality measures, definitions, and reporting vary widely. As stated, the service-quality standards are company-specific, versus statewide or regional benchmarks.

Appendix 2 highlights a number of the states where PBR or merger-related activities have resulted in utility-specific standards. Notably, mandates in utility-specific

⁵ There appears to some ambiguity on the exact number of gas utilities that must meet customer service targets as several states have established standards for electric utilities that are combination gas and electric utilities employing customer service staff that handle both electric and gas service calls and inquiries. For example, the XCEL merger order (Minnesota) specifies customer service targets and penalties for the centralized call center that handles gas and electric call, with supplemental reporting requirements for gas operations without attendant penalty provisions.

PBR or mergers contain standards or incentives and penalties that either supplement or do not appear in current regulations or statewide standards.

ADDITIONAL DATABASES AND SOURCES OF COMPARABLE DATA FOR SERVICE-QUALITY STANDARDS

In addition to the state level information discussed above, Navigant also examined federal and utility industry databases, as well as private company databases. Navigant researched each of the agencies and associations listed below. Notably, member organizations such as the AGA and EEI maintain strict confidentiality agreements for data collected from members, and therefore NCI was unable to acquire data and information from the individual members. Participants in these data collection and benchmarking efforts are typically precluded from sharing the data with non-participants. Therefore, there is limited information available to the DTE from these sources to use as potential data points against which to benchmark the performance of the Massachusetts distribution companies.

FEDERAL SOURCES

Energy companies routinely file information with several federal agencies, including the Department of Energy and the Department of Labor. Most of this information is publicly available through the individual agencies or through commercial database providers. Financial information is filed in accordance with a specified chart of accounts, and operational data requirements are detailed through the Code of Federal regulations. While some of the information can be useful, NCI found that, with the exception of the Lost-Time incident rate, a direct relationship to the service-quality metrics monitored by the DTE is virtually non-existent.

NARUC

The National Association of Regulatory Utility Commissioners (“NARUC”) has been very active with regards to industry restructuring and performance standards. For that reason, Navigant examined various NARUC-sponsored reports and databases to compare and supplement our review of service-quality standards. Although in 2001 and 2002, NRRI conducted a survey of state commissions on behalf of NARUC, NARUC has

not proposed specific performance standards or prepared benchmark data. The NRRI study resulted in a survey titled “*The State Public Service Commission Reliability Survey*” which sought responses to inquiries related to the existence of formal standards on electric reliability and service-quality, service indices, benchmarks, performance targets, definitions, inspections requirements, power quality, data systems, and incentive ratemaking. Forty of fifty states responded to the survey during 2001 and 2002.

EDISON ELECTRIC INSTITUTE

EEL is an industry organization that provides for the exchange of information, reports and recommendations for entities involved in electric utility issues and policy initiatives. EEL members typically meet twice a year where they attend task force meetings and presentations. This group does not archive proceedings and although task forces are formed to deal with specific issues, these task forces are not permanent entities. A task force on electric reliability reporting has been working to create a better benchmarking instrument and is striving to provide better comparability between member companies. Although this group is making progress, they are far from achieving their goal. The survey instrument has changed from year to year with blind results being provided to member utilities (i.e., the results are not identified by utility).

EEL also collects similar survey information regarding call center operations. Conversations with EEL program managers, however, indicate a decreasing level of participation, increasing concerns about competitive advantage, a range of reporting standards and information variations, and reluctance for these companies to adopt a common reporting platform.

AMERICAN GAS ASSOCIATION

AGA surveys members and compiles information annually on a range of service-quality related issues. However, the number of companies participating in the annual AGA survey has declined in recent years due to mergers. The topics surveyed are determined by the AGA and vary annually. Although the AGA strives to maintain consistency from utilities reporting the data, such factors as information systems, business practices, regulatory requirements and other regional differences result in data that provides useful insight to the member companies to identify best practices within the

industry; however, often the data cannot be used for comparative purposes. In addition, the results of these studies are not made available to the public since participants are required to sign confidentiality agreements. Therefore, Navigant was unable to collect specific information from subcommittee activities and the corporate office during this study.

PRIVATE SOURCES OF DATA

Various consulting firms and professional organizations periodically develop, collect, and report survey information regarding service-quality measures. Such efforts typically are limited to the fee-based participating members. These reports are frequently modified on an annual basis to meet the then current issues of interest to the participants.

Numerous private benchmarking organizations exist, however, Navigant contacted and reviewed information pertaining to the following efforts because these organizations have been named in service-quality proceedings before the DTE:

- American Productivity and Quality Center;
- Electric Power Transmission Benchmarking Association;
- Electric Utility Benchmarking Association;
- Energy Systems and Technology Benchmarking Association;
- International Association for Benchmarking Electric Distribution;
- International Call Center Benchmarking Consortium; and
- PA Consulting.

With the exception of the American Productivity and Quality Center and PA Consulting, the same company owns each of the other organizations.

All of the organizations are focused primarily on developing a list of customers that annually establish a list of one or more issues to be reviewed. The topics frequently change from year-to-year. Involvement in the efforts is fee-based and the information cannot be shared with non-participants.

Most of the benchmarking organizations are focused on identifying best practices related to topics of interest to the participants. Data is collected and analyzed. The top five companies are visited to determine the best practices. The organization then produces a report that summarizes its observations regarding the best practices. The reports do not provide information for all of the participating companies.

Appendix 3 summarizes Navigant's findings regarding various sources of benchmarking data prepared by private firms and/or organizations.

III. COMPARABILITY OF DATA TO MASSACHUSETTS UTILITIES

Benchmarking has been a common practice in the utility industry for many years in terms of assessing, for internal purposes, a company's competitive position in the market place or in devising motivational performance strategies for management and employees. However, to fully understand and rely on the results of comparative data, one must understand how each company has collected, interpreted and reported the requested data. Therefore, although benchmark data may be useful for market-positioning or motivational purposes, it is an entirely different matter to assess financial penalties based upon the application of such data.

Beyond the comparability arguments associated with the benchmarking data, it is also imperative to evaluate the specific concerns and desires of a company's customers with regards to service-quality measures. For instance, customers are concerned about the reliability of utility services they receive. The customer is typically not, however, always willing to pay more for improved service. For example, the Illinois Commerce Commission considered establishing statewide electric reliability standards that would be uniformly applied to each electric utility in the state. This raised the issue of needing to ascertain what level of service reliability customers desired and at what cost. The Commission ultimately backed away from making any changes in the existing reliability rule. One of the reasons for the Commission's decision that a uniform standard would be inappropriate was that it was demonstrated that the cost of electric service could be significantly higher if the utilities were required to achieve a statewide standard. Similarly, the use of comparative benchmarks to evaluate the performance of the Distribution Companies in relation to the established service-quality measures may result in levels of service that exceed what customers want and/or involve costs that customers are not willing to pay.

STATES WITH SIMILAR SERVICE-QUALITY STANDARDS

Most standards that NCI identified are utility specific. NCI is not aware of any states that employ regional or nationwide data to establish standards. Some states recognize that area-specific factors cause expected variances for some standards and

therefore, have developed or proposed standards for specific areas within each utility service territory.

States have primarily set reliability standards based on utility-specific targets, while several states have set targets by operating area within a company.⁶ For example, New York currently has assigned minimum and objective reliability thresholds for subzone or operating areas throughout the state. Appendix 4 summarizes recent targets and penalties recently established for New York utilities. As the Appendix shows, the range of targets, penalties and standards vary broadly among New York utilities, and several targets, reporting requirements, and incentives and penalties are utility-specific.

Other state jurisdictions have addressed the question of whether the performance of energy companies can be benchmarked against the performance of other companies. Table 4 summarizes the reasons offered by state commissions and regulatory proceedings as to why service-quality standards have not been applied on a statewide, regionwide or nationwide basis:

Table 4 - Utility-Specific Service-quality Standards

Jurisdiction	Docket No.	Scope of Proceeding	Reason for Rejecting Statewide Standard
California	N.A.	Research performed by outside consultant for Staff	Concluded that using an industry benchmark resulted in an “apples to oranges” comparison
Illinois	00-0310	Gather data pertaining to the cost for each utility in the State to achieve defined sets of SAIFI and CAIDI	Establishment of a statewide standard would require significant investment by utilities and did not consider customer expectations
Minnesota	E-999/R-01-1671	Establishment of service-quality standards	Meaningful standards have to be utility specific
Texas	N.A.	Part of merger proceedings	Recognized differences in each utilities operating territory.

⁶ Vermont has set different reliability targets for each utility; one utility has targets for the entire service territory, the other has specific targets for each of 3 operating areas

APPLICABILITY OF FEDERAL, PRIVATE OR INDUSTRY DATA SOURCES

1) Federal Sources

As noted earlier, NCI found that a direct relationship to the service-quality metrics monitored by the DTE is non-existent. Therefore, Navigant concludes that there are minimal valid federal information sources to use in building any type of regional or national benchmark for a majority of the service-quality measures of interest. The relevance of using service-quality and reliability performance data from government sources has been commented on by the agencies and other parties in the past. In 1997, the Energy Information Agency conducted an in depth set of focus group discussions across the industry on the “Implications For Data Collection, Analysis, And Reporting on the Electric Power Industry.”⁷

2) Industry Associations

Data from industry associations like EEI, IEEE, AGA, and NRRI could be useful in benchmarking particular service-quality measures (such as call center performance), depending on the nature of the survey instrument used, and could be considered, to some extent, as an alternate source of benchmarking data for the Distribution Companies. The availability, timing, cost, variations and accuracy of this data, however, are somewhat suspect. Users must often normalize the results against their own demographics and situations, and participation in these venues is declining over time due to the competitive nature of the distribution industry. Also, as noted earlier, confidentiality of member data usually precludes access of the information necessary to independently perform benchmark studies.

⁷ Citations include a range of comments regarding the lack of uniform methodology. States would like to compare their data against the average number of outages nationally and for regional utilities; for instance, New England. Some respondents question the reliability and accuracy of the reports. For example, State officials described EIA data as “good,” but one participant said doubts arose when State numbers and EIA numbers differed. Others indicated that utilities may not fill out forms properly and that uniform definitions among states are critical. Although EIA sends utilities the same forms, utilities may not follow instructions or fill the forms out correctly; some definitions may not be uniform. Other commented that PUC’s need national and regional data for comparing the performance of utilities in reliability and customer satisfaction. Others indicated that utility companies in an unregulated environment would be less interested in making reliability information widely available.

3) Private Sources

Information from private or proprietary databases or data-sharing consortiums is useful, to an extent, to contributing members, but often is derived from the federal information collected in FERC Forms 1 & 2, and Annual Reports. Similar reporting data often is tailored to the specific needs of the consortium partners at any given point in time, and can change from year-to-year. This creates problematical issues regarding long-term consistency and definitional variations among elements over time. Due to the proprietary nature of this data, Navigant was not able to examine in detail the results of these subscription-type services. NCI questions whether the available data would be in sufficient detail to calibrate the results for meaningful comparison to the Massachusetts utilities.

DEFINITIONAL ISSUES

There appears to be few states that apply similar standards to every company or comparable “dead band” methods that could be used as a benchmark. PBR programs are tailored and company-, issue- or decision-specific, and merger agreements address service territory concerns. Rate case mandates within jurisdictions reflect varied and different customer-growth rates and system status, financial drivers, adopted technologies, and customer concerns of the various utilities. Concerns include:

- Methods employed for reporting electric reliability statistics have significant differences due to varying definitions for excluding major events, interruptions affecting a small number of customers, emergencies and/or planned outages.
- Even where jurisdictions report similar concerns, for instance customer complaints or telephone/call center statistics, variances occur in definitional descriptions regarding start and end-times for calls, types of complaints, timing and resolutions agreements, etc.

COMMONALITY OF INFORMATION SYSTEMS

Data integrity is a concern since much of the service-quality performance data collected prior to the new programs established by regulatory mandates was intended for internal purposes only, which likely has led to less than accurate recording of reliability data. Regulation and detailed reporting are requiring use of advanced

information technology (“IT”) systems for tracking in several states for reliability reporting. Survey results and NCI’s experience indicate utilities increasingly are employing sophisticated Outage Management System (“OMS”) and Automated Mapping/Facilities Management/Geographic Information (“AM/FM/GIS”) systems to collect and record interruption, and at times, customer service data.⁸ Given the wide range of data collection and recording methods encountered, NCI questions whether such comparisons will yield consistent comparison based on normalized data.

Similarly, utilities increasingly are using more sophisticated systems for customer call response and answering systems for electric and gas utilities, which likely will lead to more consistent and accurate reporting of customer service data.⁹ However, the integrity and consistency of historical data used to record customer service and gas odor response rates is questionable if it were to be employed as a rigorous benchmark. NCI’s experience suggests the degree of accuracy in reported data is a direct function of the methods and systems employed to collect the data. A regulatory-ready standard adequate for benchmarking service-quality data needs to employ highly sophisticated collection tools or mechanisms to ensure consistency and accuracy. Utilities increasingly are employing OMS and integrated AM/FM/GIS to achieve consistency and a high level of data quality. NCI’s experience is that reported indices often increase dramatically with more accurate reporting. Since utilities in different jurisdictions utilize a range of data collection and reporting systems, comparability of the data becomes questionable for utility data using differing collection methods, protocol and tracking systems.

Advances and increased application of Automated Meter Reading (“AMR”) should reduce the percentage of meters read off-cycle, and over time, may result in very high levels of compliance. There continues to exist sufficient differences in how individual companies track and record service-quality data, that employing such data as a benchmark would disadvantage those companies that have improved such systems and technology, thereby essentially penalizing the companies for improving the tracking and reporting of its service-quality performance.

⁸ Many states, utilities and NARUC report highly divergent methods and systems for collecting and recording performance data. Some utilities employ fully integrated OMS and GIS, whereas others rely on manual methods.

⁹ Many combination electric and gas utilities employ common telephone answering, computer assisted drafting (CAD), work management and related systems for both electric and gas operations.

REPORTING ISSUES AND EXCLUSIONS

A significant concern with regard to reported data is the lack of consistency in the methods used to report data, particularly reliability data. For example, “exclusions” for major events, the type of outage-management system, and many other factors affect the accuracy of reported data, which invariably raises concerns regarding the validity of using the data for comparative purposes and whether such would reasonably correlate to the Massachusetts utilities. In that regard, the IEEE Working Group on System Design has authored the *Full-Use Guide on Electric Power Distribution Reliability Indices-1366-2001*. The main purpose of the guide is:

“...to present a set of terms and definitions which can be used to foster uniformity in the development of distribution service reliability indices, to identify factors which affect the indices, and to aid in consistent reporting practices among utilities....”¹⁰

This working group has recently developed a statistical methodology for identifying outlying performance (otherwise known as Major Event Days or MEDs). The method is known as the “Beta Method” because of its use of the naturally occurring log normal distribution that best describes reliability performance data, where Beta is a key parameter. Using the Beta Method, utilities can calculate indices on a normalized basis. Normalized indices provide metrics that might be used for both internal and external goal setting. The Beta method identifies the occurrence of abnormal conditions that grossly affect the reliability of a system and allows the investigation of utility performance during major events.

The IEEE guide will recommend that utilities use normalized data for comparison purposes of its own performance over time. Using this method would allow for more accurate annual comparisons of the system’s ability to meet customer reliability requirements, since the events that are beyond the design or operational limits of the system will be classified and reported upon separately. This allows a more focused and accurate review of the utility’s ability to respond to the two very different operational

¹⁰ The *Full-Use Guide on Electric Power Distribution Indices 1366-2001* is available from IEEE.

requirements of these types of events. Since the reliability indices will be reported for those events within some control of the utility, a more reasonable comparison might be made between similar utilities.

Utilities that adopt this methodology will be able to review their own performance over time on a normalized basis. That will significantly reduce the variability of the indices caused by external factors that exceed the design or operational limits of the utility. Since major events constitute a large percentage of customer interruptions, total outage duration, and call volume, any significant inconsistency in their determination may erode the confidence in reported data. Today, the guide is in draft format and may be approved by participants in the effort in 2003. If utilities and state regulatory jurisdictions across the country adopt this methodology, it may be possible to perform better comparisons in the future, however, there remains a long and arduous path to obtain full compliance with the guide.

Survey results and NCI's industry experience also support the following observations:

- Utilities that employ more sophisticated data collection methods often experience a decrease in stated reliability performance as a function of collecting more accurate information. Industry surveys have shown an increase between 25% and 150% in stated indices. In these cases, significant improvements have been made in processes and systems that collect reliability information. It is important to expect a step change when new systems come on-line and to adjust benchmarks accordingly.
- The accuracy and consistency of reported data should improve, as state commissions increasingly are requiring utilities to report the data using consistent and more rigorous methods. One way to obtain more comparability is to adopt IEEE 1366 fully.
- Some service-quality standards can be compared and normalized, (i.e. voltage frequency) but NCI has not found jurisdictions that venture far beyond very basic thresholds.

GEOGRAPHIC ISSUES

Survey results indicate that states with relatively homogeneous geographic areas tend to employ utility-specific targets; states with significant geographic differences often include area-specific service-quality standards. The utility commissions NCI contacted

frequently indicated differences in geography and weather caused these states to decline to adopt statewide standards.¹¹

Geographical and weather related data that would affect indices, mostly reliability, include:

- **Lightning Flash Density** – The contribution or percentage of lightning-related interruptions to SAIFI and SAIDI reliability indices often is high in states with high isokeraunic levels such as Florida and Colorado. The contribution of lightning to total SAIFI and SAIDI may be much lower in some northern states, particularly in winter.
- **Vegetation type and concentration** – States with high vegetation levels typically incur a high level of tree-related interruptions; whereas states such as Kansas and Arizona may have much lower tree-related interruptions.
- **Topology** – Topology can have a significant impact on SAIDI indices as the time required to restore power in mountainous or hilly terrain may be significantly higher compared to states with moderate elevation changes. Further, the amount of off-road lines sometimes is higher in hilly or mountainous regions, thereby increasing restoration times. The length of time required to respond to gas odor calls also may be higher where the topology restricts or delays access to customer premises.
- **Location (Colder versus warm regions)** – Regions that experience moderate changes in temperature, such as central California, may not experience the same level of interruptions in states where changes in weather patterns are much more severe. Also, in northern states such as Massachusetts and Connecticut, the type of tree-related interruption changes in winter months when ice- and snow-caused outages on deciduous trees can cause widespread loss of service. Similarly, the length of time required to respond to gas odor calls also may be higher where severe weather, particularly winter, may restrict ready access to customer premises.
- **Location (Rural versus urban regions)** – NCI's experience indicates SAIFI and SAIDI levels typically are higher in rural areas when compared to urban. SAIFI often is higher because of the lower amount of underground lines in outlying areas. SAIFI increases due to longer drive times by restoration crews. Similarly, the length of time required to respond to gas odor calls also may be higher in rural areas where drive times can be significantly higher.
- **Salt Contamination** – Utilities close to the seashore can experience a build-up of salt on distribution lines and devices which needs to be periodically cleaned to avoid flashovers.

¹¹ I.e., Vermont, California, Minnesota and Florida.

TYPE AND DESIGN OF CONSTRUCTED DISTRIBUTION SYSTEMS

Most commissions have not established standards based on *specific* differences in construction, voltage levels, or load density. Many states, however, recognize inherent differences in system design and construction types between utilities and therefore have adopted standards that are area or utility-specific. A striking example of the range of standards that apply due to differences in construction types are found in the standards promulgated by the New York Public Service Commission. New York established unique reliability targets for individual zones within each utility's service territory. New York's SAIFI targets range from a low of less than .01 to a high of 3.0; CAIDI ranges from a low of 1.19 hours to a high of 3.0 hours. Much of the differences are predicated on different construction types and location.

Notwithstanding data collection and accuracy and geographic issues cited above, any benchmarking effort would need to, at a minimum, recognize and normalize reported data with consideration given to:

- **Voltage class** (distribution voltages range from 2.4kV to 34.5kV) – higher voltage lines are more susceptible to interruptions.
- **Radial versus network systems** (network systems are designed for high reliability) – Systems with a large amount of secondary network distribution such as Consolidated Edison, may have SAIFI levels that are an order of magnitude lower than radial systems; however, SAIDI may be higher in some network compared to radial lines.
- **Average feeder length** - systems with longer average feeder lengths using similar circuit protection typically will experience higher SAIFI and SAIDI levels.
- **Off-road versus on-road construction** – SAIDI is often higher on systems with significant off-road construction, such as electric cooperatives and some rural utilities.
- **Bundled versus open wire and use of insulated conductor** – bundled conductor and insulated conductor often is less susceptible to interruptions than open wire construction, although SAIDI may increase due to a higher level of permanent faults.
- **Feeder and substation back-up criterion** – Utilities that apply design criterion that includes substantially high circuit and/or feeder back-up, especially those with auto-transfer schemes, likely experience lower SAIDI.

Gas utilities have a high degree of standardization for design and construction as Part 192 of the Code of Federal Regulations sets forth specific requirements for materials, line pressures, odor injection and concentration, heating values, testing methods, and design and construction to ensure consistently high safety levels. State regulators have incorporated federal standards into state regulations, which has led to consistently high levels of gas reliability and product quality. Further, gas utilities design for high reliability of supply to customers via use of loop feed systems as the cost of an interruption – that is, relighting of individual customer appliances – is sufficiently high to warrant high reliability and redundancy. Hence, state commissions have declined to impose service-quality standards to the same degree as electric utilities.

IV. FEASIBILITY OF ESTABLISHING A COOPERATIVE APPROACH TO BENCHMARKING

The preceding analysis and discussion indicates that several states have adopted standards that are similar to those adopted in Massachusetts. The electric and gas industry is increasingly adopting methods for defining standards and how such standards should be calculated; for example, accounting for major events during calculation of electric reliability indices. Further, the sophistication and accuracy of data collection and reporting systems is improving, which should provide greater consistency in reporting and tracking service-quality data. The number of states that have adopted service-quality and/or reporting standards also should improve data quality over time.

NCI's assessment also reveals that service-quality data has not been collected in a manner that provides for consistent and comparable benchmarking. The inherent differences in service-quality definitions, geography, system design and construction each suggest that utmost care be applied in developing a benchmark for electric reliability or odor call response rates for gas utilities. Exceptions may include certain customer service standards, such as call answering times and monthly meter reads. Some customer complaint standards may be more suitable for benchmarking as well. However, care must be exercised to ensure the benchmarking analysis for customer service and recognizes the different types of call answering systems and tracking methods used to compare service-quality statistics.

The DTE has made important strides in seeking to standardize definitions and data-collection requirements among Massachusetts utilities. One of the most intractable issues relating to performance benchmarking is ensuring that comparable data is being used to assess performance. Although the DTE has addressed some of the definitional and data-collection issues among the Massachusetts utilities on a going forward basis, significant issues remain in attempting to use company-specific historical data or performance data collected outside the jurisdiction for comparative benchmarking purposes. NCI also views the streamlined reporting currently required by the DTE's *Electric Outage Reporting System*, which requires utilities to report real-time and post-event reporting of feeder-interruption data, will also provide value in the future in terms of assessing service-quality. Further, the quality and consistency of reporting should

improve over time with the streamlined processes and standardized protocols that the DTE has put in place and will review annually on a company-specific basis.

V. SUMMARY

The focus of state regulatory agencies to date, with regards to the establishment of service-quality measures, has been focused primarily on standards for electric utilities. NCI's survey of state commissions, utilities, state and federal agencies and third-party data confirms that several states employ reporting and service-quality requirements that are similar to those specified in DTE 99-84. Further, utilities, state and federal agencies and other entities often conduct benchmarking studies for a range of purposes, including data collection methods and reporting. The differences in definitions, data collection methods and data quality, geography, and distribution system design and configuration, however, each undermines the likelihood that such data would meet the rigorous standards needed to support use of *service-quality* benchmark data at this time. Many state and federal commissions recognize these limitations and the inherent differences among utilities and therefore have declined to adopt national standards, regional standards or standards developed in other states as a benchmark. The industry is now adopting more consistent reporting and sophisticated data collection methods, which will improve the accuracy of reported data over time. Nevertheless, NCI advises caution regarding the use of non-company specific data for establishing service-quality standards. Attempts at this time to establish regional or national benchmarking efforts could produce questionable results due to differences in data quality, collection methods, system design, construction, geography and weather.

Respectfully prepared and submitted by:

Michael J. Adams

Director

December 19, 2002

Appendix 1
States Requiring Reporting on Service-quality Measures
Similar to those Adopted by the DTE

ID	State	SAIFI	SAIDI	Odor Response	On Cycle Meter Reading	Telephone Response Time	Service Appointments	Worker Lost Time	Customer Complaint Tracking
AL	Alabama							✓	✓
AR	Arkansas	✓	✓					✓	
AS	Alaska							✓	
AZ	Arizona							✓	✓
CA	California	✓	✓					✓	✓
CO	Colorado	✓	✓			✓		✓	✓
CT	Connecticut	✓	✓					✓	✓
DC	District of Columbia							✓	
DE	Delaware					✓	✓	✓	
FL	Florida	✓	✓					✓	✓
GA	Georgia							✓	
HI	Hawaii					✓		✓	
IA	Iowa	✓	✓					✓	
ID	Idaho (PACIFICORP only)	✓	✓			✓		✓	
IL	Illinois	✓	✓	✓				✓	
IN	Indiana	✓	✓			✓		✓	
KS	Kansas (KCPL & WESTAR)	✓	✓	✓		✓		✓	✓
KY	Kentucky	✓	✓					✓	
LA	Louisiana	✓	✓					✓	✓
MA	Massachusetts	✓	✓	✓	✓	✓	✓	✓	✓
MD	Maryland	✓	✓					✓	
ME	Maine	✓						✓	✓
MI	Michigan				✓	✓		✓	✓
MN	Minnesota	✓	✓		✓	✓	✓	✓	✓
MO	Missouri							✓	✓
MS	Mississippi	✓	✓					✓	
MT	Montana							✓	
NC	North Carolina	✓	✓	✓		✓		✓	
ND	North Dakota	✓	✓					✓	✓
NE	Nebraska							✓	
NH	New Hampshire	✓	✓	✓		✓		✓	
NJ	New Jersey							✓	
NM	New Mexico							✓	
NV	Nevada	✓	✓					✓	
NY	New York	✓			✓	✓	✓	✓	✓
OH	Ohio	✓	✓			✓		✓	✓
OK	Oklahoma							✓	
OR	Oregon	✓	✓					✓	✓
PA	Pennsylvania	✓	✓			✓		✓	✓
RI	Rhode Island	✓	✓			✓			
SC	South Carolina							✓	
SD	South Dakota							✓	
TN	Tennessee							✓	
TX	Texas	✓	✓					✓	
UT	Utah	✓	✓	✓		✓	✓	✓	✓
VA	Virginia		✓					✓	
VT	Vermont	✓			✓	✓	✓	✓	✓
WA	Washington	✓	✓	✓		✓	✓	✓	✓
WI	Wisconsin	✓	✓			✓		✓	
WV	West Virginia							✓	✓
WY	Wyoming							✓	
	Total	31	29	7	5	19	7	50	22

Appendix 2

Service-quality Standards for States With Performance Based Rates

- **California** – San Diego Gas & Electric and Southern California Edison each have PBR plans that include penalties and rewards for SAIDI, employee safety, and customer satisfaction. The performance targets have shifted over time.
- **Colorado** – XCEL Energy must achieve certain performance standards for calls answered (within 45 seconds), customer satisfaction, and SAIDI.
- **Delaware** – Service-quality standards imposed from the Pepco/Conectiv merger and consolidated resolutions of other outstanding cases includes answering 80% of calls within 30 seconds, a 5% call abandonment rate ceiling, and handling 95% of all calls by a human or IVR contact. It also includes customer service guarantees that carry customer payment fees: (1) a four-hour window for appointments (\$25), and (2) accurate bills (\$5).
- **Kansas** – The OneOK/Western Resources gas property merger resulted in standards and penalties for Kansas Gas Services, including call center performance and response time to odor calls.
- **Minnesota** – The Public Utilities Commission recently imposed specific service-quality standards for reliability and customer service to XCEL Energy's Minnesota jurisdiction in conjunction with a merger agreement.
- **New York** – Each of the major utilities must achieve individual and different sets of performance standards and measures.
- **North Carolina** – The regulator imposed certain service expectations on North Carolina natural Gas after its merger with Carolina Progress, and on Public Service of North Carolina after its merger with SCANA. These included response times to leak calls (18 minutes and 19.4 minutes, respectively), call abandonment rates under 4%, and call answering times of 20 seconds for 83% of the calls.
- **North Dakota** – Both Otter Tail and NSP have PBR programs that require certain levels of service-quality and performance including 25 basis point penalties and rewards for CAIDI, SAIDI, SAIFI, (with dead bands), employee safety (dead band around NCEA utility group), customer satisfaction (with a dead band), and price (benchmarked to regional prices).
- **Rhode Island** – NEES/EUA merger settlement agreement includes performance standards for SAIDI, SAIFI, customer satisfaction, and calls answered within 20 seconds.
- **Utah** – The PacifiCorp/Scottish Power merger led to the imposition of 8 customer service guarantees, including resolving billing problems within 10 days, keeping appointments, and providing 2 days notice for planned interruptions. If not met, the company pays up to \$100 to affected customers. Performance standards include

answering 80% of telephone calls within 20 seconds, responding to all complaints within 3 days, improving worst performing circuits over a two-year period, and improving SAIDI and SAIFI by 10% by 2005.

- **Vermont** – The Department of Public Service established reliability and customer service-quality standards and reporting in rate orders for Green Mountain Power and Central Vermont Public Service, the 2 largest utilities in the state; performance standards will follow shortly for other utilities.
- **Washington** –Mergers resulting in Puget Sound Energy (Puget Power and Washington Natural) and Pacificorp/ScottishPower resulted in two very different PBRs. PSE has a Service-quality Index and reports on 10 benchmarks, including SAIDI, SAIFI, telephone answering, gas safety response, appointments, and customer satisfaction. Pacificorp reports on CAIDI, SAIFI, MAIFI, telephone response, and complaint resolution.

APPENDIX 3

Summary of Benchmarking Organizations/Associations

Organization	Mission	Data Availability	Accessibility	Type of Benchmarking
American Productivity and Quality Center	With a focus on benchmarking, knowledge management, metrics, performance measurement and quality improvement initiatives, APQC works with its member organizations to identify best practices, discover effective methods of improvement, broadly disseminate findings, and connect individuals with one another and the knowledge, training, and tools they need to succeed.	Benchmarking efforts focus on a specific industry, process, or topic	Sign-up required	<ul style="list-style-type: none"> Can perform a study for \$30-40K to obtain data Currently no data available as no studies have been performed on service-quality and reliability Once a study is performed it will not be further sold or replicated
Electric Utility Benchmarking Association	To identify "Best in Class" business processes, which, when implemented, will lead member companies to exceptional performance as perceived by their customers	<ul style="list-style-type: none"> Consortium studies are offered to the membership as a whole with costs divided. Single company sponsored studies addressing the interest of one member company can be 	<ul style="list-style-type: none"> Sign-up required Currently, membership is FREE. Costs of studies are shared by the participants. 	<ul style="list-style-type: none"> No database or previous studies available A study can be performed for \$60-75k for one utility, or \$15 k per utility for a number of utilities

Organization	Mission	Data Availability	Accessibility	Type of Benchmarking
		offered to other selected members for no fee.		
International Association for Benchmarking Electric Distribution	Dedicated to providing members with an opportunity to identify, document and establish best practices through benchmarking to increase value, efficiencies, and profits.	<ul style="list-style-type: none"> Consortium studies are offered to the membership as a whole with costs divided. Single company sponsored studies addressing the interest of one member company can be offered to other selected members for no fee. 	<ul style="list-style-type: none"> Sign-up required Currently, membership is FREE. Costs of studies are shared by the participants. 	<ul style="list-style-type: none"> No database or previous studies available A study can be performed for \$60-75k for one utility, or \$15 k per utility for a number of utilities
Electric Power Transmission Benchmarking Association,	<ul style="list-style-type: none"> To conduct benchmarking studies of important electric transmission management processes. To create a cooperative environment where full understanding of the performance and enablers of "best in class" electric transmission management processes can be obtained and shared at reasonable cost. 	<ul style="list-style-type: none"> Consortium studies are offered to the membership as a whole with costs divided. Single company sponsored studies addressing the interest of one member company can be offered to other selected members for no 	<ul style="list-style-type: none"> Sign-up required Currently, membership is FREE Costs of studies are shared by the participants. 	<ul style="list-style-type: none"> No database or previous studies available A study can be performed for \$60-75k for one utility, or \$15 k per utility for a number of utilities

Organization	Mission	Data Availability	Accessibility	Type of Benchmarking
	<ul style="list-style-type: none"> To use the efficiency of the association to obtain process performance data and related best practices from regarding electric transmission management. To support the use of benchmarking to facilitate electric transmission management process improvement and the achievement of accuracy, timeliness and efficiency. 	fee.		
Energy Systems and Technology Benchmarking Association,	To identify "Best in Class" energy systems and technology business processes, which, when implemented, will lead member companies to exceptional performance.	<ul style="list-style-type: none"> Consortium studies are offered to the membership as a whole with costs divided. Single company sponsored studies addressing the interest of one member company can be offered to other selected members for no fee. 	<ul style="list-style-type: none"> Sign-up required Currently, membership is FREE Costs of studies are shared by the participants. 	<ul style="list-style-type: none"> No database or previous studies available A study can be performed for \$60-75k for one utility, or \$15 k per utility for a number of utilities
International Call	An association of contact	<ul style="list-style-type: none"> Performance 	<ul style="list-style-type: none"> Sign-up required 	<ul style="list-style-type: none"> No database or

Organization	Mission	Data Availability	Accessibility	Type of Benchmarking
Center Benchmarking Consortium	center professionals to compare operating performance and identify the best business practices.	statistics help companies determine where they stand vs. similarly situated organizations.	<ul style="list-style-type: none"> Basic membership is currently available at no charge to qualified individuals. Participation in association activities will be charged separately. 	<p>previous studies available</p> <ul style="list-style-type: none"> A study can be performed for \$60-75k for one utility, or \$15 k per utility for a number of utilities

Appendix 4

SUMMARY OF PERFORMANCE INCENTIVE PLANS IN NEW YORK							
							As of 7/02
	Service Measure	CHG&E	Con Ed	NYSEG	NMPC	O&R	RG&E
General Inf	Dates in service	Jul-01 - Jun-04	Jan-01 - Dec-04	Jan-02 - Dec-07	Jan-02 - Dec-12	1997 - Indefinite	Oct-97 - Oct-02
	Tax Method	Post-tax		Post-tax	Pre-tax	Pre-tax	
	Graduated Penalties	Yes	Yes	Yes	Yes	No	Yes
	Offset for Positive Perf.	No	Yes	No	No	No	No
Reliability Measure	Stats Basis	Company-wide	CW - Network / Radia	CW - Simple Avg	Company-wide	Company-wide	Company-wide
	CAIDI	2.1 / 2.2	3.35 1.75	2.08 / 2.18	2.07	1.54	1.90
	Standard (Min)	1.84 - 2.45	2.75-3.75 1.12-1.77	1.30 - 2.50	1.52 - 3.00	1.46 - 1.70	1.41 - 1.80
	SAIFI	1.10 / 1.20	.006-.015 0.34-0.62	1.20 / 1.26	0.93	1.70	1.27 / 1.33 / 1.40
	Standard (Min)	1.08 - 1.60	.006-.020 0.34-1.23	0.70 - 2.75	0.60 - 1.41	2.00 - 2.50	1.01 - 2.20
	Momentaries	No	No	No	Trans/Dist	No	No
Other Measures	PSC Complaint Rate	6.0 - 8.0	7.0	Yes	5.0 / 7.5	10.6	9.0
	Autopenalty	No	Yes	No	No	No	No
	Major Outages	No	Yes	No	No	No	No
	Answer Time (%)	No	Yes	No	78 / 72	No	73 / 71.5 / 70
	Bill Accuracy	No	Yes	No	No	No	97 / 97.15 / 97.3
	Meters Read (%)	No	No	No	89.5 / 88.5	No	No
	Unscheduled Estimates	No	Yes	No	No	No	13.70%
	Missed Appointment	No	No	No	No	No	1%
	Customer Sat. Survey	Yes	Yes	Yes	Yes	1 Res / 1 Comm	Yes
	Contact Sat. Survey	No	No	Yes	No	No	No
	Installation-Initial (days)	No	Yes	No	No	No	No
	Installation-Final (days)	No	Yes	No	No	No	No
	Investigations Comp.	No	Yes	No	No	No	No
	Corp Res Trans Index	No	No	No	Yes	No	No
	Low Income Assistance	No	No	No	Yes	No	No

Note: KeySpan and National Fuel have additional requirements that are not reflected in the Appendix.